

Work Order ID 117818

May-05-14 11:45:01 AM

117818

Page 1

Item ID: D2244-116 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: STEP EXTRUSION **173 138**
 Start Date: 5/05/14 Start Qty: 60.00 ***60*** Cust Item ID:
 Required Date: 5/05/14 Req'd Qty: 60.00 ***60*** Customer:
 Reference:

Approvals: Process Plan: MLJ Date: 140506 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D2244	Rev D1								

100 PURCHASING 0.00

100

Purchasing

Purchasing

PURCHASING

Memo

Issue P/O: **24193**

a) Extrude as per Dwg D2244

b) Material: 6061-T6 (QQ-A-200/8)

c) Minimum yield tensile strength = 35 ksi

d) Minimum ultimate tensile strength = 38 ksi

e) Minimum elongation = 8%

f) Order at 116" long

g) Caradon Indalex Tool # MH-18865

h) Material cert's is required

EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS.

MUST BE WELL PACKAGE, IF NOT IT WILL BE REFUSE

CL 14/05/13 173

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
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Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Crimp/Kink/Ripple/Wave <input type="checkbox"/> Cuffs <input type="checkbox"/> Crushing <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Marks/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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Page 2

May-05-14 11:45:01 AM

Item ID: D2244-116 Accept *N900040100* Setup Start *NS1*

Revision ID: Stop *NS2*

Item Name: STEP EXTRUSION

Start Date: 5/05/14 Start Qty: 60.00 *60* Cust Item ID:

Required Date: 5/05/14 Req'd Qty: 60.00 *60* Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
110	Receive & Inspect for Damage & Mat'l Certs	0.00							
110									
Packaging	Memo	0.00							
Packaging	Ensure certification are attached								
120	QC6- Inspect dimensions to drawing	0.00							
120									
QC	Memo	0.00							
Quality Control	Check Pull test per Dwg D2244 for compliance page attached. Check hardness with Webster tester								
130	Identify as per dwg & Stock Location:	0.00							
130									
Packaging	Memo	0.00							
Packaging									

DAS
27
9-89
14/7/13

138

~~138~~

SP14-6-27

138

138

14-F-3 DK

Back Hall

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
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Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
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Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

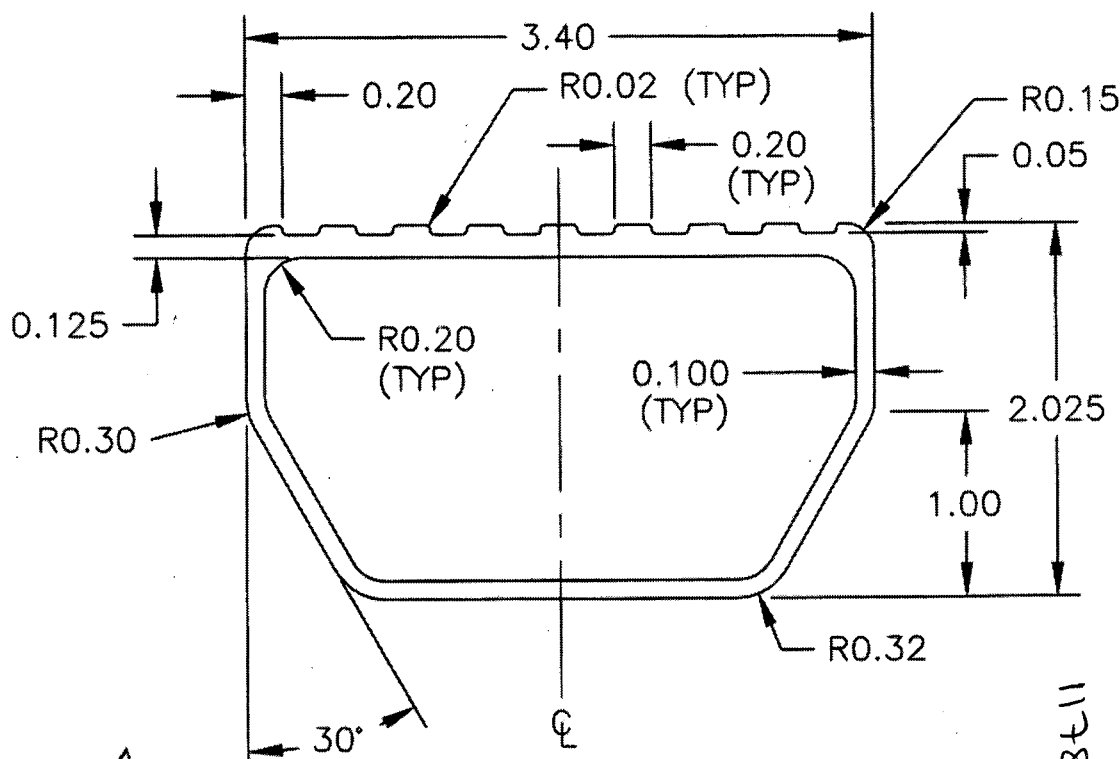
FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Crimp/Kink/Ripple/Wave <input type="checkbox"/> Cuffs <input type="checkbox"/> Crushing <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Marks/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
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DESIGN BW		DRAWN BY <i>CP</i>		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>KE</i>		APPROVED <i>HA</i>		DRAWING NO. D2244	
DATE 98.11.18		TITLE STEP EXTRUSION		REV. D SHEET 1 OF 1	
A	94.07.05	NEW ISSUE			
B	94.07.11	REDESIGNED			
C	94.08.08	REDESIGNED			
D	98.11.18	REMOVED 6005A MATERIAL INCORPORATED DEO 9081			
DI	01.04.17	ADDED DIE # <i># CP</i>			

RELEASED
1981.11.25 KE



DI MANUFACTURED USING CARBON INDALOX DIE # MH-18865

PART NUMBER D2244-XX.X
XX.X IS CUT LENGTH IN INCHES

MATERIAL: 6061-T6 (QQ-A-200/8)

A SAMPLE FROM EACH BATCH WILL BE PULL TESTED TO ASTM STANDARD B221 BY AN APPROVED TESTING FACILITY TO ENSURE THAT THE BATCH MEETS THE MINIMUM MECHANICAL PROPERTIES STATED BELOW:

MINIMUM TENSILE YIELD STRENGTH = 35 ksi
MINIMUM ULTIMATE TENSILE STRENGTH = 38 ksi
MINIMUM ELONGATION = 8%

TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

117818 ML3
14-05-06

DART
AEROSPACEDart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053**PURCHASE ORDER****Purchase Order ID PO24193****Purchase Order Date** 5/13/2014**PO Print Date** 5/13/2014**Page Number** 1 of 2**Order From :**
SAPA CANADA INC
C/O 912420
P.O. BOX 4090 STN A
TORONTO, ONTARIO M5W 0E9
CANADA

VC-SAP001

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA**PAID**
5/14/2014**Contact Name**
Vendor Phone 800 563 5120

Ship To Contact
Ship To Phone
Ship Via: Yours ppd
Ship Acct:**Buyer** Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency CAD
FOB FCA - (Free Carrier)

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	E
1	D2600-7-140P EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES NICKS OR DENTS EXTRUDE AS PER DWG D2600-7-140 REV. E DIE # MS-18872 B117896	Ext. "I Beam" Thick	6/3/2014 Yes 6/3/2014		94.00 ✓ Each	\$26.34	\$:
						Line Total:	\$:
2	D2244-116P EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES NICKS OR DENTS EXTRUDE AS PER DWG D2244-116 REV. D DIE # MH-18865 B117818	Step Extrusion	6/25/2014 Yes 6/25/2014		173.00 ✓ Each	\$29.67	\$:

SP14-6-2

SP14-6-27

Note:

5/13/2014

325 rue Avro
Pointe-Claire, QC, Canada, H9R 5W3
Téléphone (514) 697-5120
Fac-simile (514) 694-8310

sapa:

Rapport des propriétés mécaniques Mechanical Properties Test Report

Client / Customer : **DART AEROSPACE LTD**
Adresse / Address : **270 ABERDEEN STREET
HAWKESBURY ONT,
K6A 1K7**

commande Sapa / Sapa order # : **4051019**

bon de commande / Purchase order # : **p024193**

de matrice / Die # : **MH 18865**

Description : **Step Extrusion**

Alliage & trempage / Alloy & temper : **6061 T6**

Customer Part # : **D2244-116P**

Contrôle / Control # : **19025-1**

Coulée / Cast # : **59333**

	Min.requis Min.required	Résultat actuel Actual results
Tension ultime Ultimate stress (psi)	38 000	40263
Contrainte élastique Yield stress (psi)	35 000	35 462
% élongation dans 2" % elongation in 2"	8	12
Dureté Rockwell E (hre) Rockwell E Hardness (hre)	88 @ 100	93

Composition chimique typique / Typical chemical composition :

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti
6063	0,20 - 0,60	0,35 Max	0,10 Max	0,10 Max	0,45 - 0,90	0,10 Max	0,10 Max	0,10 Max
6005	0,60 - 0,90	0,35 Max	0,10 Max	0,10 Max	0,40 - 0,60	0,10 Max	0,10 Max	0,10 Max
6005A	0,68 - 0,72	0,15 - 0,27	0,08 - 0,12	0,20 - 0,24	0,48 - 0,52	0,03 Max	0,05 Max	0,03 Max
6061	0,40 - 0,80	0,70 Max	0,15 - 0,40	0,15 Max	0,80 - 1,20	0,04 - 0,35	0,25 Max	0,15 Max
6351	0,7 - 1,3	0,5 Max	0,10 Max	0,40 - 0,80	0,40 - 0,80	---	0,20 Max	0,20 Max

Nous certifions que le matériel fourni rencontre les exigences chimiques telles qu'annoncées par la norme ASTM B-221-08 excepté pour la section 8.2 (nombre de spécimen) .

We hereby certify that the material supplied meets the chemical properties as published by the ASTM B-221-08 except for section 8.2 (number of specimen) .

Sincèrement vôtre,
Yours truly,

date : **2014-05-29**



Gilles Pelletier
Technicien de la qualité
Quality technician

MATERIAL RECEIPT INSPECTION FORM

MATERIAL: 02244-116
 DATE: July 3-2014

PO / BATCH NO.: 24193

MATERIAL CERT REC'D: Yes
 QUANTITY RECEIVED: 138
 QUANTITY INSPECTED: 138
 QUANTITY REJECTED: 0

THICKNESS ORDERED: 0.100
 THICKNESS RECEIVED: 0.104
 SHEET SIZE ORDERED: 116"
 SHEET SIZE RECEIVED: 116"

DESCRIPTION	NCR (Check Y/N)		COMMENTS
SURFACE DAMAGE	Y	<input checked="" type="radio"/> N	
CORRECT FINISH	<input checked="" type="radio"/> Y	N	
CORROSION	Y	<input checked="" type="radio"/> N	
CORRECT GRAIN DIRECTION	<input checked="" type="radio"/> Y	N	
CORRECT MATERIAL	<input checked="" type="radio"/> Y	N	
CORRECT THICKNESS	<input checked="" type="radio"/> Y	N	
PHOTO REQUIRED	Y	<input checked="" type="radio"/> N	
CORRECT MATERIAL	<input checked="" type="radio"/> Y	N	
CORRECT REF # TO LINK CERT	<input checked="" type="radio"/> Y	N	ASTM B-221-08
CORRECT MATERIAL IDENTIFICATION	<input checked="" type="radio"/> Y	N	#S9333
CORRECT M# ON THE MATERIAL	<input checked="" type="radio"/> Y	N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y	<input checked="" type="radio"/> N	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y	<input checked="" type="radio"/> N	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW					
TYPE OF MATERIAL SIZE OF TEST SAMPLE HARDNESS / DUROMETER READING	HRC	HRB	DUR A	DUR D	

testers located in the Quality Office

QC 18 INSPECTION		ENGINEERING SIGNOFF (if required)
INSPECTED BY: <u>PAS 27</u> DATE: <u>11/13</u>	SIGNED OFF BY: _____ DATE: _____	

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

MATERIAL RECEIPT INSPECTION FORM

INSTRUCTIONS FOR INSPECTING BAR, TUBING, ROUND, & SHEET STOCK

- 1- VERIFY STOCK TO DART PURCHASE ORDER
- 2- MEASURE ALL DIMENSIONS FOR EACH PURCHASED STOCK
 - a. WIDTH, THICKNESS, DIAMETER, WALL THICKNESS & LENGTH
- 3- VERIFY CONDITION OF MATERIAL i.e. DAMAGED, CORRODED, etc.
- 4- VERIFY THAT SUPPLIER HAS A NUMBER (HEAT #) ON ITS RECEIVING REPORT TO LINK TO MATERIAL CERTS
- 5- VERIFY MATERIAL CERTS ARE CORRECT TO THE DART PO INSTRUCTIONS
- 6- REMOVE / CUT A PIECE OF MATERIAL FOR SAMPLE HARDNESS TESTING

INSTRUCTIONS FOR INSPECTING SKIDTUBE & STEP EXTRUSION

- 1- VERIFY TO DART SUPPLIED DRAWING
- 2- SAMPLE INSPECT MATERIAL IN BUNDLE TO ENSURE MATERIAL CAN BE RECEIVED INTO DART
- 3- USING PORTABLE HARDNESS TESTER VERIFY HARDNESS OF THE MATERIAL TO THE DRAWING
- 4- VERIFY THAT MATERIAL CERTS MATCH TO WHATS CALLED UP ON THE DART DRAWING

AFTER MATERIAL PASSES INSPECTION

- 5- HAVE DART EMPLOYEES START STOCKING MATERIAL BUT REQUEST MIN **20pcs** FOR FULL INSPECTION
- 6- INSPECT ALL DIMS AS PER DRAWING REQUIREMENTS

INSTRUCTIONS FOR INSPECTING CROSS TUBE MATERIAL

- 1- VERIFY MATERIAL CERTS MATCH THE REQUIREMENTS ON THE DART DRAWINGS
- 2- INSPECT MIN. HALF THE BATCH OF EXTRUSION RECEIVED INTO DART
- 3- INSPECT MATERIAL AS PER THE EXTRUSION REPORT
 - a. WALL THICKNESS USING ULTRA-SONIC IN 4 LOCATIONS
 - b. OUTSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - c. INSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - d. STRAIGHTNESS @ CENTER OVER 12" SPAN
 - e. WALL THICKNESS USING TUBE MICROMETER HIGHEST/LOWEST BOTH ENDS
- 4- IDENTIFY EACH TUBE IN SEQUENCE OF INSPECTING (TUBE 1, TUBE2.....) AND W/O# AND PO#
- 5- RECORD ALL FINDINGS ON EXTRUSION REPORT

IF ANY QUESTIONS PLEASE SEE QC COORDINATOR BEFORE GOING FURTHER